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AUTHOR Stahl, John; And Others
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ABSTRACT

On-line performance assessment was developed to maximize the usefulness of performance assessment and to minimize the time and labor costs incurred. This paper reports on the development of an on-line performance assessment instrument, focusing on the establishment and validation of the scoring rubric and its implementation in the Rasch model, the training of raters, and technological implementation of the instrument. The instrument discussed is the Assessment of Motor and Process Skills (AMPS), a performance instrument used by occupational therapists to determine the effectiveness of a program of rehabilitative therapy for clients. Clients complete skills from the assessment and are rated for difficulty and level of challenge they can handle. A computerized scoring version was developed with software that depends on calibrations of task and skill items developed from previously collected AMPS data. Approximately 3,300 clients were used in the initial study, and data from 4,766 clients were used in the final calibration. The resulting instrument is a highly portable and user-friendly program that helps therapists manage therapeutic regimes for their clients. Approximately two-thirds of the paper consists of appendixes containing the program user manual and sample reports. (Contains one table and five references.) (SLD)

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On-line Performance Assessment Using Rating Scales

John Stahl

Betty Bergstrom

Rebecca Shumway

Computer Adaptive Technologies

Anne Fisher

Colorado State University

Paper presented at the Annual Meeting of the American Education Research Association

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On-line Performance Assessment Using Rating Scales

Introduction

The use of performance assessments has increased dramatically in the past few years in many different arenas of testing. This growing interest in the benefits of performance assessment has developed concurrently with widespread criticism of more objective assessment tools, particularly multiple choice tests. Some of the most frequently addressed flaws in objective testing are that they utilize a one-right-answer approach, draw on a narrowed curriculum, primarily address only discrete skills, and provide a disproportionate representation of examinees of various socioeconomic groups (Hambleton & Murphy, 1992). Educators are turning to performance assessments as a means of achieving more "authentic" measures of a student's ability to perform a task or mastery of a subject; job performance evaluations are relying more on observational data in assessing the competence of employees, and certification and licensure organizations are integrating task related performance assessments, sometimes referred to as work samples, into their batteries of test instruments.

The time and labor costs involved in implementing a performance assessment, however, are major considerations that must be taken into account (Reckase, 1993). In a typical performance assessment, examinees prepare work samples which are collected at a central location. Raters or judges are assembled, undergo a training session that can vary in intensity, and then rate the quality of the samples. Alternatively, judges are trained and sent out to observe and assess the performance of examinees. In addition, the development and validation of a scoring rubric involves an enormous investment of time and effort, including input of expert judgment, field testing of preliminary drafts, and finalization of the evaluation instrument.

On-line performance assessment was developed to maximize the utility of performance assessment and to minimize the time and labor costs incurred. The computerized assessment software program was designed specifically to provide a convenient tool for raters entering observational rating scores and to produce meaningful feedback on clients' progress and the quality and consistency of raters. Using previously collected data on the tasks and skill items to be assessed, calibrations are established in accordance with an extended version of the Rasch model. These calibrations are fundamental to the on-line assessment system because they provide standardized cases for the training of raters and make it possible to estimate client ability.

A series of reports, which are a primary function of on-line assessment, provides information regarding client performance, areas in which improvement is needed, and unexpectedly high or low scores--which may be indicative of errors in score recording or rater inconsistency. The computerized system also has the ability to produce a report displaying the results of multiple evaluations, allowing the rater to analyze progress over time. Together, these reports enable raters to direct their efforts toward areas in which clients have the greatest need. In addition, because the on-line system utilizes full password protection, confidentiality of the information it contains is guaranteed.

The purpose of this paper is to report on the development of an on-line performance assessment instrument. Issues that will be addressed in the paper include: 1) the establishment of the scoring rubric and its implementation in an extended Rasch model, 2) training of raters, 3) validation of the AMPS rubric and procedures for monitoring the internal

consistency of raters, and 4) technological implementation of the assessment instrument in a computerized program.

The AMPS Project

The example used in this paper is the Assessment of Motor and Process Skills (AMPS) project (Fisher, 1995). AMPS is a performance assessment instrument used by occupational therapists to determine the effectiveness of a program of rehabilitative therapy for clients. At various stages in the therapeutic regime, the therapist observes the client performing domestic or instrumental activities of daily living (IADL) and evaluates the effectiveness of his or her performance. The goal is to determine whether or not the therapy is assisting the individual in his or her ability to function independently. Clients are rated while performing standardized instrumental activities of daily living (IADL), such as making a peanut butter and jelly sandwich or sweeping the floor. Two categories of rating scales are used: motor skills and process skills.

The AMPS rating scales were developed by Anne Fisher at Colorado State University (Fisher, 1995). The administration of an AMPS evaluation encompasses the following steps:

1) The client is interviewed and then chooses several of the AMPS IADL tasks to perform.

2) The client and the therapist agree on any constraints of the tasks chosen. (This is called setting the task contract.)

3) The client and the therapist set up the environment in which the tasks are to be performed.

4) The client and the therapist review the task contract. The AMPS observations begin.

5) The therapist observes the client's performance of the task.

6) The therapist scores the performance. For each task performed, the client is evaluated on 16 motor skill items and 20 process skill items. (Fisher, 1995, p. 3)

Motor skills are those observable actions that a person uses to, "move oneself or the task object during all task performances," while process skills are those that a person uses to, "sensibly organize and adapt the actions of task performance as the process unfolds over time" (Fisher, 1995, p. 3). A listing of the motor and process skills are found in Table 1. A detailed discussion of each of these skill areas and how they are used in an AMPS evaluation can be found in Fisher (1995).

The ultimate goal of the AMPS performance assessment is to answer two questions: 1) "Why does this person experience difficulty?" and 2) "What level of task challenge can this person handle?" (Fisher, 1995, p. 4). The first question is answered by examining the ratings assigned to the various tasks and identifying those particular skill areas or tasks that are especially difficult for the individual to perform. This examination provides the groundwork for planning future treatment to address specific areas of disability experienced by the client. The second question is answered by analyzing the ratings using the extended Rasch Model, or FACETS model. This analysis generates ability measures located on two scales of ability: one for motor ability and one for process ability. The scales are linear, allowing the therapist to gauge the client's progress toward recovery. By making repeated observations during the course of therapy, the therapist is able to determine the effectiveness of the interventions.

Scoring Rubric

The AMPS scoring rubric uses a 4-point rating scale to codify the observations of the performed skills on the agreed upon tasks. A score of "4" indicates effective performance of

the skill, whereas a score of "1" indicates extreme difficulty (unsafe practice or need for assistance) in performing the task under observation. The results of the scoring are analyzed using an extended version of the Rasch model. The basic Rasch model can be considered a two-facet model with one facet for person ability and a second facet for item difficulty, whereas the extended Rasch model is a latent trait model which estimates multiple facets--in this case, client ability, rater severity, task difficulty, and skill item difficulty. The equation for the extended Rasch model used in the AMPS program is as follows:

Equation 1

$$Ln\left(\frac{p}{1-p}\right)=B_n-D_t-E_i-R_s-F_k$$

Where: p = the probability of awarding a value on the rating scale.
B_n = the ability of the client to perform the observed skill as a part of the agreed upon task.
D_t = the difficulty of the task being observed.
E_i = the difficulty of the skill item being observed.
R_s = the severity of the rater performing the observations.
F_k = the difficulty of that particular score or step on the rating scale.

Each component of the assessment is modeled as an independent facet. Facets for client ability, rater severity, task difficulty, item difficulty, and scale step difficulty are constructed. For each facet, the sum of the scores awarded is used to estimate the placement of facet elements on a common scale.

A standard error of measure accompanies each facet, indicating the precision of the estimate. As with all measurements, an increase in the number of observations increases the precision of the estimation. All estimates are on a common log-linear scale, which allows

comparisons to be readily made. Interactions can also be modeled, allowing detection of unusual interactions between raters and skill items, or raters and particular clients.

In addition, two fit statistics are routinely presented with each analysis, identifying any client, rater, task, or item whose participation in the rating assessment deviates from the expectations of the model. In general terms, the expectation is that the more able clients will score higher on the tasks and items than less able clients; that more difficult tasks and items will receive lower scores than easier tasks and items; and that more severe raters will award lower scores than more lenient raters.

The infit statistic is the weighted mean squared residual across all cases, weighted by the variance of the probability of achieving a certain score. It is sensitive to deviations at the points close to the center of the scale. The outfit is the mean squared residual across all cases. Because it lacks the weighting of the infit, it is more sensitive to outliers which appear as unexpectedly high or low ratings. As such, the outfit provides a particularly valuable clue in detecting errors in the application of the rating of especially strong or weak areas in a client's therapeutic program.

The Training of AMPS Raters

The usual approach to evaluations that use raters is to view any variability between ratings as an undesirable source of error. The goal of almost all training programs is to reduce rater variability as much as possible. For example, if the "validation committee" determines that a simulated client should receive a score of "3" on a particular skill on a designated task, then all raters are "trained" to assign a "3" to that observation. In addition, scoring rubrics are refined to reduce instances where raters might tend to disagree. In a rather

procrustean manner, rater training and rigidly structured scoring rubrics are used in an attempt to force raters to emulate an "ideal" rater. The rather poor inter-rater reliability statistics generally reported attest to the lack of success of such procedures.

By contrast, the training of AMPS raters takes a more Pollonian approach, in that raters are trained to be as honest and consistent as possible in their assessment of their clients. In other words, in the AMPS training program, variability between raters is accepted as a given. This is not to say that raters are allowed complete freedom; they receive extensive training in the concepts underlying each of the skills being rated and are presented with opportunities to apply these concepts in actual evaluations. The training of an AMPS rater extends over 5 days. During this time there are discussions of the AMPS model, the establishment of the task contract with the client, the meaning of each of the skills observed in the context of the client's overall performance, the use of the 4-point rating scale in establishing the observational score, the use of the AMPS computer program, and interpretation of the computerized output. The therapists become very familiar with the evaluation rubric, but no attempt is made to force them to use the rubric in the same manner as any other therapist. As discussed above, rater variability is accepted as a latent trait in the extended Rasch model. Likewise, variation in rater severity is modeled as part of the estimation equation. Therefore, the resulting measures for a client take into account these differences among therapists.

During the course of their training, therapists are asked to rate a variety of pre-calibrated cases. These cases are presented on video tape and function as standardized cases. The estimated ability of the clients represented in these cases has been established by collecting

observations over an extended period of time and drawing on a large number of therapists. As of 1995, more than 5,000 clients from North America, Scandinavia, the United Kingdom and Australasia had been used in the AMPS development. A total of 56 tasks and 36 skill items have been calibrated and found to fit the extended Rasch model (See Equation 1). Close to 500 therapists were used in the calibration studies (Fisher, 1995, p. 123).

Once a therapist has completed the training course, the ratings collected for him or her during the course of the training are used to generate a preliminary rater severity calibration. This rater severity is based on Equation 1. All elements on the right side the equation, except the rater severity, are fixed values. The probabilities for the left side of the equation are derived from the ratings that the therapist awards the standardized cases. Once the rater severity calibration has been constructed, the therapist is required to collect data on an additional 10 clients in his or her normal therapeutic setting. The results of these observations are then forwarded to AMPS headquarters. There, a refined rater severity will be generated and an update on the rater's severity will be sent to the rater to be incorporated in his or her copy of the AMPS scoring program.

Validation of the AMPS Program

Prior to the implementation of the AMPS program in an on-line computer product, an extensive validation program was undertaken. The analysis of the AMPS rubric for the purpose of developing computer-scoring software was accomplished in two stages. First, existing data was analyzed to, "verify that a single, international, cross-cultural scale could be developed and used to assess clients from diverse diagnostic subgroups" (Fisher, 1995, p. 127). Approximately 3,000 clients were used in the initial study. The primary purpose of the

study was to verify the stability of the task and skill item difficulties across different subgroups, based on either ethnic or diagnostic categories. Inconsistencies in difficulty estimates across subgroups can affect client ability estimates produced by the computerized program. Some variability was detected in the item difficulties across diagnostic groups; however, when client ability estimates were derived using the subgroup specific item difficulties as opposed to a total group item difficulties, the researchers found that, "approximately 95% of the subject ability measures remained stable within ±0.10 logits and that less than 1% differed by more than the mean standard error" (Fisher, 1995, p. 130). (The reader is referred to Fisher, 1995 for a complete description of the validation studies.) In the final step of the validation process, data from 4,766 clients were used in a final calibration run. From this analysis, calibration values were derived for each of the 16 motor skill items, 20 process skill items, and 56 tasks that were used in the development of the AMPS computer program.

Implementation of the AMPS Program on Computer

The AMPS scoring software program was developed as a joint effort of the AMPS Project and Computer Adaptive Technologies, Inc. From the beginning, several principles guided the program's development. The scoring program had to be relatively simple to use, particularly for the input of the observational rating scores. Also, the program had to produce output that would contribute meaningfully to the progress of the therapy while providing the therapists feedback that would allow them to monitor their own internal consistency and highlight areas of concern. (A copy of the manual that accompanies the software is included as Appendix A.)

The foundation of the program was the data previously collected by the AMPS Project. Based on this data, calibrations on the tasks and skill items to be used in the software program were established. These calibrations also provided the standardized cases used in the training of therapists as AMPS raters and were entered into the AMPS program as fixed calibrations to be used in the estimation of rater severity. The construction of client ability calibration paralleled the way that raters were calibrated, except that in this case all values on the right side of the basic equation are fixed except for the client ability (See equation above). Again, the probabilities are derived from the rating awarded and the degree of rater severity is accounted for in the estimation process.

The AMPS program is pre-loaded with the severity of the raters and the difficulty of the tasks, skill items, and rating steps. Demographic information on the client, such as age, sex, ethnic group, and medical diagnosis, can also be pre-loaded. With this information contained in the program, when a therapist is performing an evaluation, he or she merely has to indicate which task or tasks are being performed and enter the ratings awarded to the various skill items. The program is setup to allow the option of entering the ratings, using a data entry screen, immediately after the observations are conducted. Also, a provision is made so that free-form notes can be attached to any evaluation. This allows the therapist to include observations that fall outside the structure of the scoring rubric, but may be highly pertinent to the conduct of the therapy.

Reports

A set of five pre-established reports are integral to the program. (Examples of each report can be found in Appendix B.) The battery of reports generated by the AMPS program

provides the therapist with the information necessary to guide the course of a client's therapy and to self-monitor his or her own internal consistency. The AMPS Report categorizes the ratings for each skill item into a three-step ordinal scale: Adequate, Marginal, and Markedly Deficient. This report provides a summary of the client's performance and readily highlights areas in which the client demonstrated a need for further improvement.

The Misfit Report is designed to highlight unexpectedly high or low scores awarded to a skill item or items. Unexpected high or low scores may result from errors in recording scores. More importantly, they can also be the result of either a client deficiency that requires special attention, or a rater's internal inconsistency. In the former case, the Misfit Report can help the therapist to focus his or her efforts where they are most required. In the latter case, the report assists the therapist in monitoring his or her use of the rating scale. If a rater consistently misfits on a particular item, for example, then he or she can begin to explore the reasons why he or she has a tendency to award either higher or lower scores on that particular item. The Misfit Report is an advantage of the extended Rasch analysis in that it provides much more detailed diagnostic information than other methods of analysis that focus on aggregate scores. In addition, the report presents information in a non-comparative, non-judgmental manner, which has been found to be more favorable to raters than reports which compare their performance to other raters.

The Notes Report allows the therapist to print out a copy of any notes recorded as part of an evaluation. Notes serve as a valuable adjunct to the rating evaluation and allow the therapist to record observations in a free-form memo format. An optional title can be attached to the notes report to enable the therapist to keep track of the reports printed.

The fourth report is the Graphical Report, which displays the estimated ability measures of the client on both the motor and process scales. The greatest benefit of the Graphical Report is that the results of multiple evaluations can be displayed on the same report. If the evaluations shown on the report were conducted at different times, then the amount of progress made between the two evaluations is readily apparent on the report. This allows the therapist to easily gauge the measured effectiveness of the therapy conducted between the two occasions. An added feature of the Graphical Report is its indication of a cut-off score on both scales. (Clients who are above the cut-off scores in ability measure are judged to be able to function independently.) These cut-off scores are based on thousands of empirical observations in which assessments of clients' functional ability were made independent of the AMPS observations.

The final report, the Raw Scores Report, is a print out of the raw scores awarded to each skill item on each task observed during a particular evaluation. The Scores Report provides a hard copy of the evaluation observations which can be incorporated into a client's file and used as a record and reference for his or her course of therapy.

Confidentiality

Another important aspect of the software program is its password protection capability, which affords the highest confidentiality to information stored on clients. Only therapists who have been through the AMPS training program receive the rater disk that allows access into the AMPS program. Each therapist is assigned a password code that must be entered each time he or she accesses the program. Confidentiality of client data is also maintained when data is exported to the AMPS headquarters. All identification on the client is

removed from the export files when they are created.

Discussion

This paper has focused on the development of an on-line computerized assessment software program which implements the Assessment of Motor and Process Skills (AMPS) evaluation system. The AMPS program encapsulates the results of years of research into a highly portable, user-friendly software to provide therapists with the information they need to manage therapeutic regimes for their clients. While the AMPS program is specialized to meet the needs of the AMPS project, the steps taken in the program's development are directly relevant to the development of a similar on-line system for any program that uses raters for assessment purposes.

The developmental stages of performance assessment, such as the creation and validation of the scoring rubric and the training of raters, are vital components of both traditional and computerized assessment methods. But because the computerized system incorporates the extended Rasch model, it allows administrators of performance assessments to maximize the results of their assessments and to implement them with relative ease. By allowing each facet of the evaluation process to be independently estimated, the extended Rasch model permits the focus of the assessment to be centered appropriately, while all other facets of the evaluation process are fixed. The significance of this capability is two-fold: it allows the calibration of new raters during rater training, and it allows the estimation of client ability immediately following an evaluation.

The practical applications of on-line computerized assessment are broad. A prime example of an arena that could benefit from computerized assessment is the grading of essay

tests. Using the on-line system, data could be evaluated using the extended Rasch model to yield calibrations on essay prompts and on types of essays. (See, for example, Engelhard, 1992 & 1994.) These calibrated essays, along with a set of calibrated samples, could then form the basis of rater training and the calibration of rater severity. In addition, a teacher, as a trained and calibrated rater, could take the computerized system into the classroom and perform essay evaluations that would provide immediate feedback to both the student, the school administrators, and the teacher. Other fields of assessment that could benefit from computerized assessment include competitions that use judges, performance evaluations in the work place, certification and licensure tests in which demonstration of ability to perform a given task is more important than test performance, and mastery tests in which educators must determine whether a student has mastered a subject.

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Table 1

Motor and Process Skills Used in AMPS

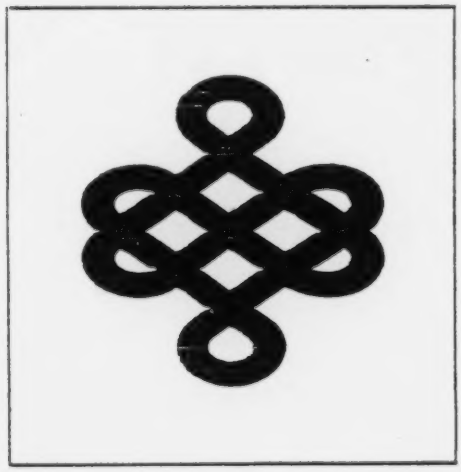
Motor Skills		
Stabilizes	Coordinates	Lifts
Aligns	Manipulates	Calibrates
Positions	Flows	Grips
Walks	Moves	Endures
Reaches	Transports	Paces
Beads		
Process Skills		
Paces	Initiates	Restores
Attends	Continues	Navigates
Chooses	Sequences	Notices\Responds
Uses	Terminates	Accommodates
Handles	Searches/Locates	Adjusts
Heeds	Gathers	Benefits
Inquires	Organizes	

Appendix A

AMPS Computer-Scoring Program User Manual

AMPS Computer-Scoring Program

User Manual



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Contractor/Manufacturer is
Computer Adaptive Technologies, Inc.
2609 West Lunt Avenue, Suite 2
Chicago, Illinois 60645

Business Office:	312-274-3286
FAX:	312-274-3287
Internet:	Sales @CATINC.COM
	TechSupp @CATINC.COM
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Introduction

Welcome to the AMPS Computer-Scoring Software. The Software that you will receive at the completion of your AMPS training is your personal copy. AMPS Computer-Scoring software is only available to individuals who have completed the AMPS Training Program. The software contains your name, your rater identification number, and your personal rater calibration value. This information is required for you to access and use the software. All reports generated by the software will be personalized to include your name, and all of your AMPS results will be adjusted for your rater severity.

The data that you store in the AMPS Computer-Scoring Program can be used to generate a number of reports as described in the AMPS Manual. This data can also be used to update the AMPS calibration values and recalibrate you as a rater. It is very important, therefore, that you only use your own identification number and that you only use this program to enter your own data. Allowing others to use your identification number will invalidate your data and make you ineligible for future upgrades of this program.

We have tried to make the program and this manual as user friendly as possible. Your comments regarding problems and suggestions for improvements would be greatly appreciated. Technical problems with the installation of the AMPS program should be addressed to CAT, Inc. All other comments and suggestions should be sent to:

AMPS Project
Colorado State University
Occupational Therapy Building
Fort Collins, CO 80523
USA

FAX: 1-970-491-6290

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Installing AMPS

Installing AMPS on an IBM compatible computer (refer to the following section if you are installing AMPS on a Macintosh computer)

Before installing the AMPS Computer-Scoring Program on an IBM Compatible ensure that your disk is labeled "Windows Version." If your disk is labeled "Macintosh Version" please call CAT, Inc. technical support for assistance. Second, check the installation disk for the presence of a file named README.TXT. Installation and documentation changes in this file, if any, will supersede the contents of this manual. Use your favorite DOS editor or word processing program to read the README.TXT file. Or, to obtain printed copy, type the following command at the DOS prompt:

COPY A:README.TXT LPT1:

NOTE
If using a port other than LPT1 for your printer, substitute that port in the previous command.

Contact your software/computer consultant if you have trouble understanding the following information. After viewing the README.TXT file, install the AMPS program as follows:

Step 1: Install Microsoft Windows version 3.1 or later, if necessary.

Step 2: Modify your computer's AUTOEXEC.BAT file to include the following: Look for a line that contains the word "Share". If the SHARE line does not exist you may skip to Step 3. The Share file command must indicate at least 1024 bytes as follows:

SHARE /F:1024.

You can modify this statement by opening the file in any word processor. After making the required changes you must save the file as an ASCII (DOS TEXT) file.

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Step 3: Modify your CONFIG.SYS file to include the following statements:
FILES=100
BUFFERS=40

Step 4: Turn your computer off and then back on so the changes to the AUTOEXEC.BAT and CONFIG.SYS files will take effect.

Step 5: Start Microsoft Windows. If your computer does not automatically start Windows, change to the Windows directory by typing **cd \windows** and pressing the **Enter** key. Then type **Win** and press the **Enter** key

Step 6: Place the AMPS Installation Disk #1 in the A or B disk drive.

Step 7: From the Windows Program Manager, not the File Manager, select the **Run** command from the File menu.

Step 8: Type **A:SETUP** at the command line if the Installation Disk #1 is in the A drive. Type **B:SETUP** if the Installation Disk #1 is in the B drive. Follow the on-screen instructions.

Step 9: A message appears on your screen when the program is correctly installed. Select the OK command in this window. An icon for AMPS appears in the appropriate program group within the Microsoft Windows program.

Step 10: The first time you start AMPS, a window will automatically open that will ask you to select the country in which you will be using the program.

Click on the arrow next to the country box and then click on the appropriate country. You will then be asked to put the rater disk you obtained at your training course in the A or B drive and press the Enter key.

An OPEN FILE window will appear. Select the drive in which you placed the rater disk and then highlight the file RATER.DAT. This file contains your name, your rater ID number, and your calibrated rater severity.

Click on the **Open** button and the program will automatically load your information. The initial window will return with the RATER.DAT file name highlighted. Press the **Enter** key to continue.

Installing the AMPS Computerized Scoring Program on a Macintosh Compatible Computer (refer to the previous section if you are installing AMPS on an IBM compatible computer)

Before installing the AMPS Computerized Scoring Program on a Macintosh compatible computer first examine the disk label for the words "Macintosh Version". If your disks are labeled "Windows Version" please call technical support for assistance. Second, check the installation disk for the presence of a file called README. Installation and documentation changes in this file, if any, will supersede the contents of this manual. Click on the README icon to read the README file.

After viewing the README file, install the AMPS program as follows:

Step 1: Start the computer. You should turn off any Anti-Virus programs before beginning, as they may interfere with the installation process. If you do not know whether you have an Anti-Virus program or do nor know how to deactivate the program, contact your software/computer consultant.

Step 2: Place the AMPS installation disk #1 in the disk drive. If the AMPS installation disk icon does not appear on the screen, double click on the **AMPS installation 1 icon.**

Step 3: Click on the **AMPS installation disk icon**. The **AMPS installation 1 icon** will appear. Click on the installation icon and follow the on-screen instructions. At the completion of the installation you will receive a message saying that the "unstuffing was successful." Click on the **Quit** button.

Step 4: Once you have completed the installation process, drag the **AMPS installation 1 icon** to the trash to eject the disk from the drive. Do not eject the disk. If you eject the disk from the drive a ghost of the disc will be left on the work surface. Attempting to trash the ghost will result in a message asking you to reinsert the disk.

Step 5: The AMPS icon will be displayed in its own folder. If the icon is not readily observable, you may need to scroll up and to the right to locate it. (To do this, click on the **right pointing arrow** and hold it down until you are all of the way to the right side of the folder. Then do the same for the **upward pointing arrow**.)

Step 6: The first time you start AMPS, a window will automatically open that will ask you to select the country in which you will be using the program.

Click on the **arrow** next to the country box and then click on the appropriate country. You will then be asked to put the rater disk you obtained at your training course in the disc drive and press the **Return** key.

An OPEN FILE window will appear. Select the drive in which you placed the rater disk and then highlight the file RATER.DAT. This file contains your name, your rater ID number, and your calibrated rater severity.

Click on the **Open** button and the program will automatically load your rater information. The initial window will return with the RATER.DAT file name highlighted. Press the Return key.

NOTE: In the MAC versions, typing the **Command-Period** key combination while the program is running will cause the program to quit completely, without asking to backup data (The Command Key is frequently referred to as the "Apple Key." In the MAC version the program is set to display properly on any screen that can display 640 by 400 pixels or more. The MAC version will work on the Powerbook series of computers.

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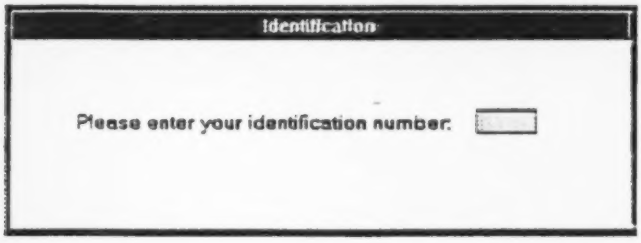
Starting AMPS

To start the AMPS program, double-click on the AMPS icon. The rater Identification screen displays:



If you elect to exit the program at this time, press the enter or return key. The program will indicate that this is an invalid identification code and ask you if you want to retry entering a valid code. Press N for "no" and you will exit the program.

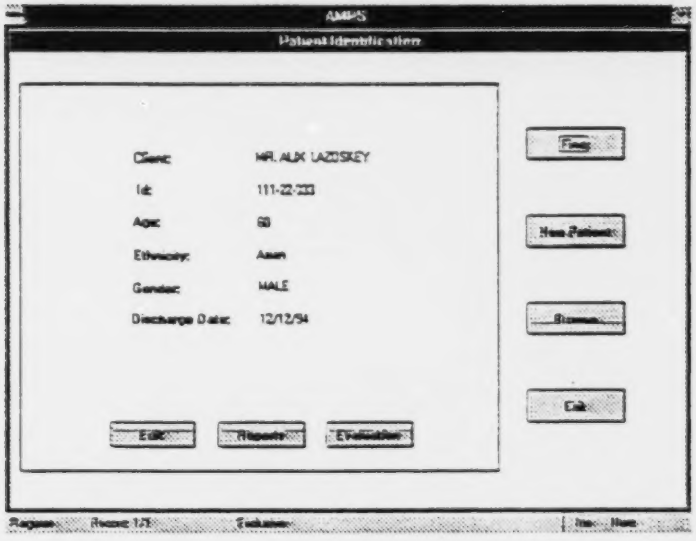
Type your rater identification number and press the **Enter** key (or the **Return** key on the MAC). The Verification screen will be displayed.

The name of the user whose identification number was entered in the Identification screen appears. If the correct name is displayed, click on the **OK** button or press **Enter/Return** to continue. If the name is incorrect, press **Cancel** and you will exit the program.

Entering New Patient/Clients

New patients/clients can be entered in the program at any time.

1. Start the AMPS program. The Patient Identification screen, as shown below, will be the first screen you see:



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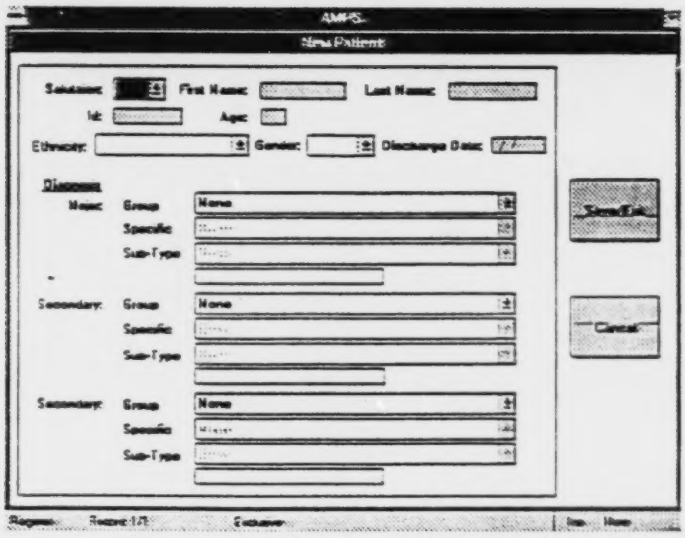
2. Click on the **New Patient** button. The following screen displays:



Before you begin to complete the information in this screen, you should know that:

- The **Tab** key moves you forward through the fields.
- The **Shift-Tab** keys move you backward through the fields.
- You can click on the **Down Arrow** to the right of a field to select from a list of items. Or you can type the first letter of a specific item to enter that item in the field. If more than one item begins with the same letter (such as Mr. and Mrs. in the *Saluration* field), type the letter repeatedly to scroll through the options beginning with that letter.
- You can click on the **Cancel** button at any time to exit the screen without saving any of the information.

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3. You can now enter patient/client data. Enter the patient/client's title, such as Mr., Mrs., Ms., Dr., etc. If you enter a title, the patient/client name will appear in all reports as title and last name (e.g. Mrs. Doe). Without a title, the patient /client will be referred to by only his or her first name and last name. **Entering the title is optional.**

4. Enter the patient/client's first name and last name in the next two fields.

5. In the *ID* field, enter a unique identification number. A maximum of twelve characters can be entered.

6. In the *Age* field, enter the patient/client's age.

7. In the *Ethnicity* field, select the patient/client's ethnic background. Click on the **down arrow** to the right of the field, then click on the **patient/client's ethnic background.**

8. In the *Gender* field, select the patient/client's gender – Male or Female.

9. In the *Discharge Date* field, enter the date on which the patient/client was discharged, if applicable. (See the section entitled *Editing Patient/Client Information* for more details.) Entering this information is optional. For months and days that are represented by a single digit, **a zero must precede the digit.** (i.e. February 1st is 02/01/95)

10. Enter the patient/client's diagnosis in the remaining fields. Select the major group diagnosis first. Several selections are available when you click on the **down arrow** to the right of the field. (See Appendix E of the AMPS Manual for a complete list.)

11. Select the specific diagnosis in the *Specific* field.

12. Select the major diagnosis sub-type, if applicable. If the **Down Arrow** to the right of the *Sub-Type* field is grayed out, this field does not apply for the selected diagnosis.

You must complete all required parts of the MAJOR Diagnosis before you can save the patient/client's information.

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13. Enter optional secondary diagnosis information in the next set of fields. A third diagnosis can also be entered in the last set of fields.

14. When the information is complete, click on the **Save/Exit** button. You will return to the Patient Identification screen with the new patient/client information displayed.

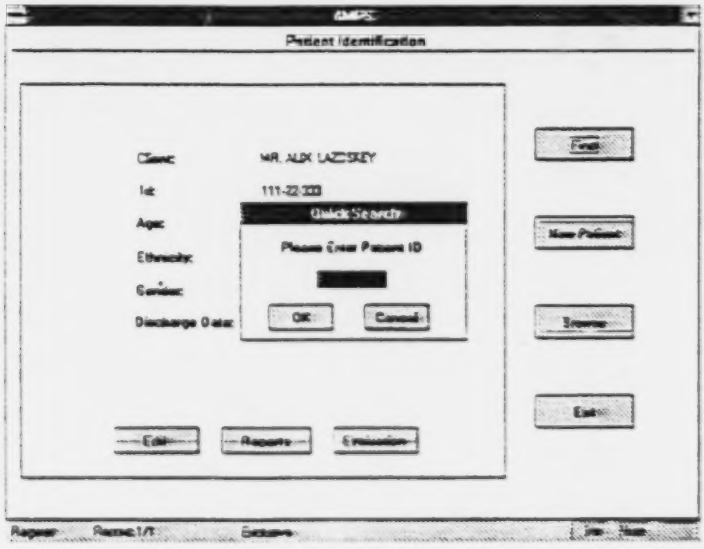
Finding a Patient/Client Who is Already in the Program

After the patient/client information has been entered in the system, you may need to change or add to the information. For example, when the patient/client is discharged, you should enter the discharge date. You can look up the patient/client in the program in one of two ways -- using the Quick Search method or the Browse method. You must know the patient/client's identification number to use the Quick Search method.

To find a patient/client using Quick Search:

1. Start the AMPS program and display the Patient Identification screen.

2. Click on the **Find** button. The Quick Search window displays:



3. Enter the patient/client's identification number and click on the **OK** button. The patient/client's information displays in the Patient Identification screen.

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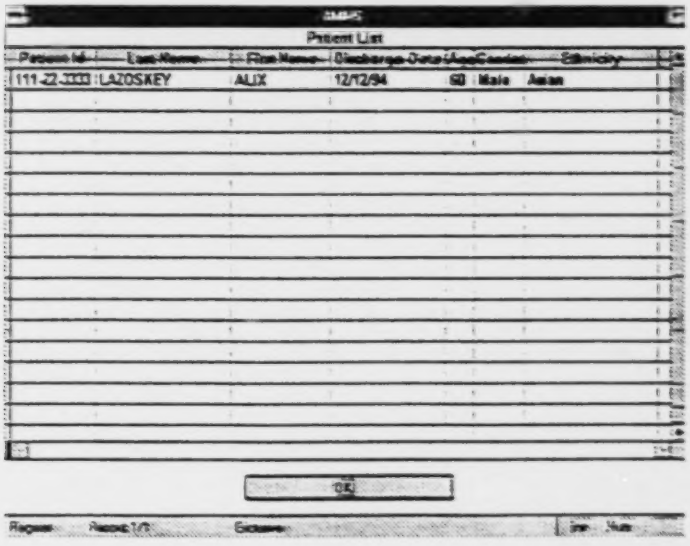
To find a patient/client using Browse:

1. Start the AMPS program and display the Patient Identification screen.

2. Click on the **Browse** button. The Patient List screen displays:



3. The patient/clients are listed in alpha order by Patient/Client name. Use the scroll bar to the right of the screen or press the **up** and **down arrows** to scroll through the list of names. The name of the patient/client that you want to find may not be immediately displayed. Use the scroll bar to locate the patient/client.

4. Highlight the patient/client whom you are looking for, and click on the **OK** button. The patient/client's information displays in the Patient Identification screen.

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Editing Patient/Client Information

Once the patient/client's information is displayed in the Patient Identification screen, you can modify the data as necessary. (See the previous section, *Finding a Patient/Client*, for instructions on looking up a patient/client's information.)

1. Click on the **Edit** button in the Patient Identification screen. The Patient Information screen displays.

2. Click the mouse on the field to be changed, or press the **Tab** key until the cursor moves to the appropriate field.

3. Enter the necessary information. (Remember, you can click on the **Cancel** button to exit the screen at any time without saving your changes.)

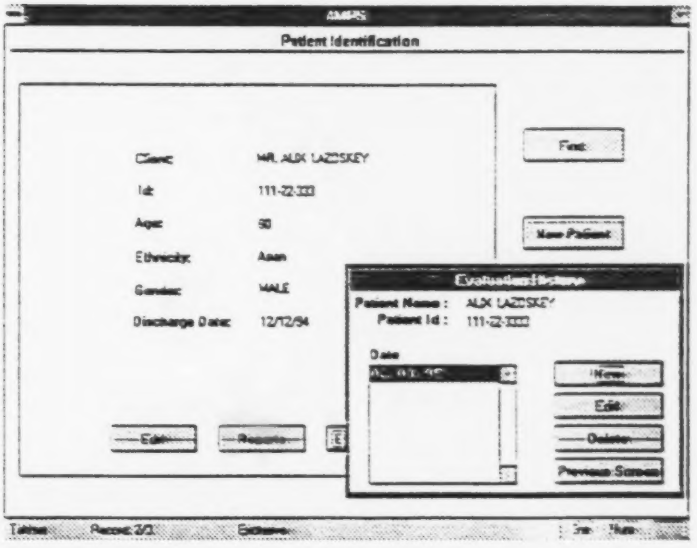
4. Continue until all fields have been updated. When finished, click on the **Save/Exit** button.

Entering an Evaluation

1. Start the AMPS program and display the Patient Identification screen.

2. Use the Quick Find or Browse method to display the patient/client for whom the evaluation is being conducted. (See the section entitled *Finding a Patient/Client* for details.)

3. Click on the **Evaluation** button. The Evaluation History window displays:



The patient/client's name and identification number is displayed. If an evaluation has been performed on this patient/client, the date on which it was conducted displays in the Date list.

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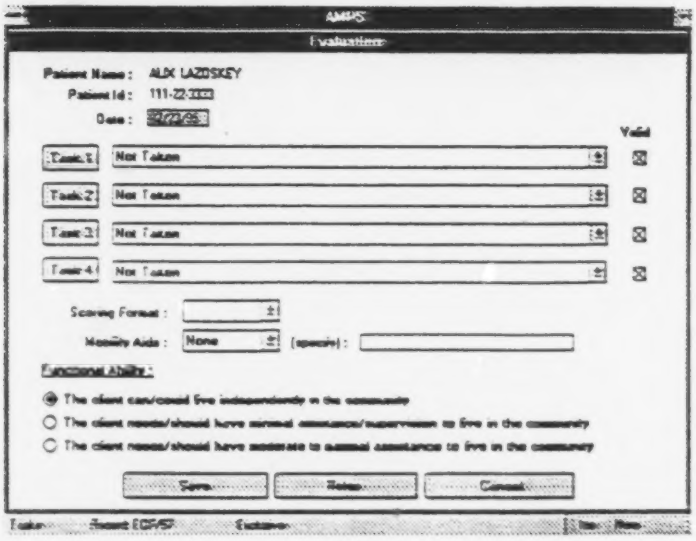
4. Click on the New button to enter a new evaluation. The Evaluation screen displays:



5. In the Date field, enter the date of the evaluation. For months and days that are represented by a single digit, **a zero must precede the digit.**(i.e. February 1st is 02/01/95)

> **NOTE**
>
> If two AMPS observations are completed on each of two separate dates, these data will be considered as two different evaluations. If you want to combine two or more evaluations and generate one set of ability measures, use the same evaluation date and enter all observations on that date.

6. Click on the **down arrow** to the right of the *Task 1* field and select from the list of tasks that appears. Double-click on the task that you wish to select. The tasks that appear in this list can be modified to display only the tasks that are evaluated at your organization. (See the section titled *Maintaining AMPS*.)

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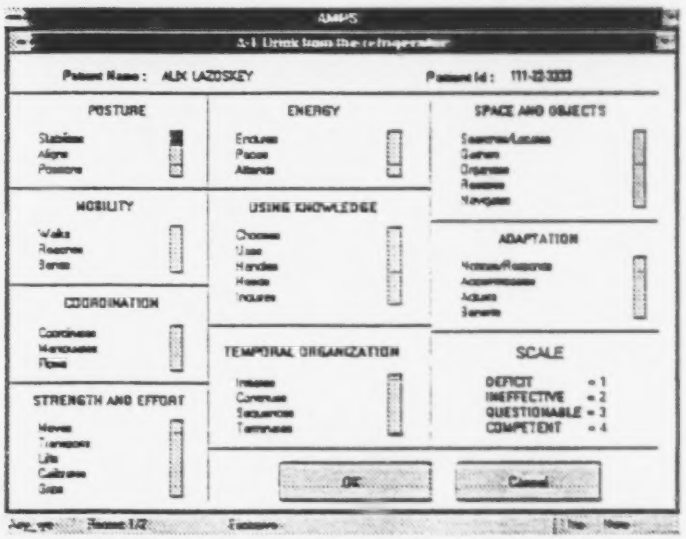
7. Double-click on the appropriate task, or highlight the task and press **Enter/Return**. The following screen displays:



8. Using the scale in the lower-right corner of the screen, rate each skill demonstrated by the patient/client. When finished, click on the **OK** button and you will return to the evaluation screen. If you decide that you do not want to save the ratings then click on the **Cancel** button. You will be returned to the evaluation screen and the ratings for that Task will not be saved. If you neglect to enter ratings for **more than 2 skill items** and attempt to save the scores a message will appear prompting you to complete the evaluation. Click once to remove the message and then click again to position the cursor on the ratings.

> **NOTE**
>
> If you need to remove a rating for a skill, enter **0** in the appropriate field. A blank will appear.

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9. In the Evaluation screen, complete Tasks 2, 3, and 4 if the client performed additional tasks.

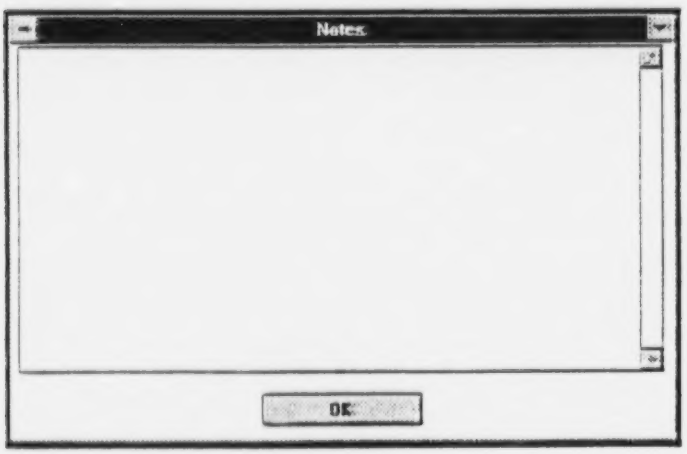
10. The *Valid* check box to the right of each task must be checked for each task that you want to include in the reports to be printed for this patient/client. You must select at least one task as valid before attempting to print any reports.

11. In the *Scoring Format* field, select the format used -- Direct or Video Tape.

12. In the *Mobility Aids* field, enter any aids used by the patient/client. If Other Mobility Aid is selected, indicate the type of aid in the *(specify)* field.

13. Indicate the patient/client's functional ability at the bottom of the screen.

14. Click on the **Notes** button to enter notes, if any, concerning the evaluation (the notes can be printed as part of the final report). The following screen displays:



15. Enter as much text as necessary. Then click on the **OK** button. You will return to the Evaluation screen.

16. Click on the **Save** button when the evaluation is complete. You will return to the Patient Identification screen.

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NOTE

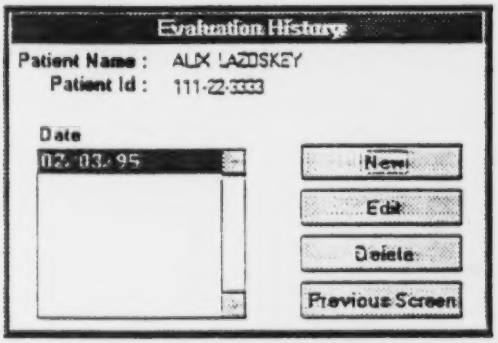
You must complete certain fields in the Evaluation screen before it can be saved. If you have not completed a required field, a message will display and the cursor will move to the required field. Enter the appropriate information and click on the Save button.

Editing an Evaluation

You can edit or add to an evaluation at any time. For example, you can add more notes or review your notes as necessary.

To edit an evaluation:

1. Start the AMPS program and display the Patient Identification screen.
2. Click on the **Evaluation** button. The Evaluation History screen displays:



3. Highlight the appropriate evaluation date if more than one exists.

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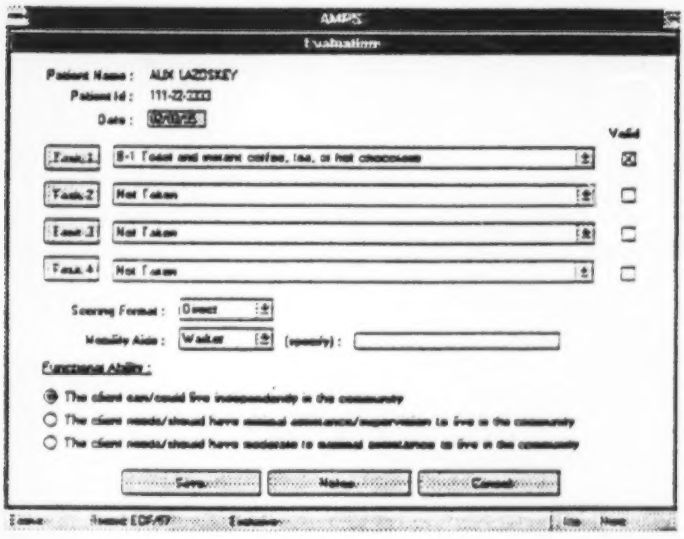
4. Click on the **Edit** button. The Evaluation screen displays:



5. Use the mouse or press the **Tab** key to place the cursor in the field to be changed. Or click on the **Notes** button to change your notes.

6. Make the necessary modifications, and click on the **Save** button in the Evaluation screen. Your changes will be saved and you will return to the Patient Identification screen.

7. If you wish to change some of the scores associated with a particular Task click on the appropriate Task button to the left of the form. The screen for recording the scores will open and you can make the desired changes.

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Deleting a Patient/Client (Deleting all evaluations for a case)

You can delete a patient/client from the program at any time. You will probably not use this feature very often. But if a patient/client's information is entered incorrectly, the data can be deleted and reentered as necessary. You should probably not delete a patient/client when they are discharged or when you no longer personally need the data. Any data that you save can be used to improve the AMPS Program. If you save data and send it to the AMPS Project, you will both help us and become eligible for AMPS Computer-Scoring Software upgrades at a reduced cost.

To delete a patient/client:

1. Start the AMPS program and display the Patient Identification screen.

2. Use the Quick Find or Browse method to display the patient/client on the screen. (See the section entitled *Finding a Patient/Client* for details.)

3. Click on the **Edit** button to display the New Patient screen.

4. Click on the **Delete** button to delete the patient/client. The message "Are you sure, (Y/N)?" displays in the upper-right corner of the screen.

5. Type **Y** to delete the patient/client, or **N** to return to the Patient Identification screen without deleting.

6. If you type **Y**, a blank Patient Identification screen is displayed. Click on the **Find** or **Browse** buttons to display another patient/client. Or click on the **New Patient** button to enter a new patient/client in the program.

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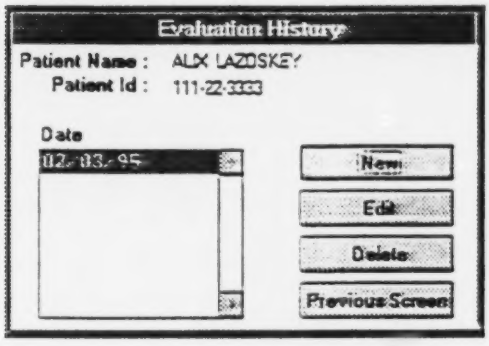
Deleting a Single Evaluation (deleting all data for one evaluation)

1. Start the AMPS program and display the Patient Identification screen.

2. Use the Quick Find or Browse method to display the patient/client whose evaluation should be deleted. (See the section entitled *Finding a Patient/Client* for details.)

3. Click on the **Evaluation** button. The Evaluation History screen displays:



4. Highlight the evaluation to be deleted if more than one date appears in the Date window.

5. Click on the **Delete** button. The message "Are you sure, (Y/N)?" appears.

6. Type **Y** to delete the evaluation, or **N** to return to the Patient Identification screen without deleting.

7. If you suspect that the data for one task observation within an evaluation is invalid, you can omit that task in the estimation of ability measures by removing the Valid Check Box mark. You can do this by clicking on the Edit button in the screen above and then clicking on the Valid Check Box next to the suspected Task. This will remove the check mark in the box.

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Generating Reports

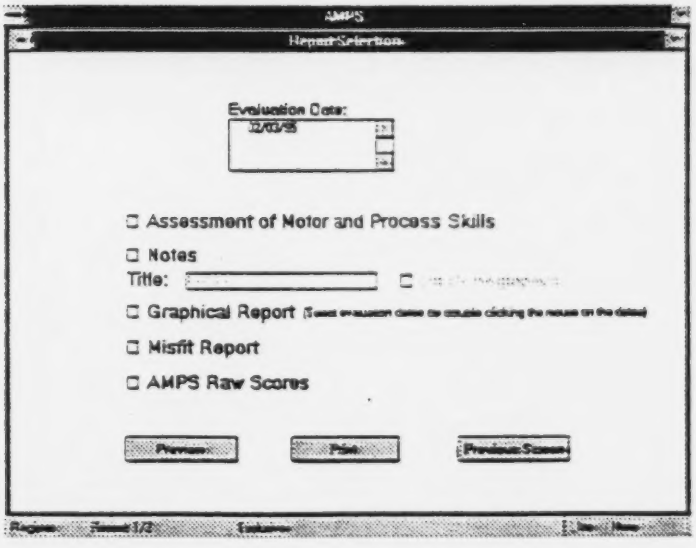
Before you can generate a report for a specific patient/client in the AMPS program, you must enter at least one evaluation for that patient/client. You can then generate up to five reports – the Assessment of Motor and Process Skills, Notes (as entered in the Evaluation screen), the Graphic Report of the AMPS Results, the Misfit Report, and the AMPS Raw Scores Report. For some reports to print properly, **you must have Courier Font installed** on your computer. If you are having problems printing a report or the format of the reports looks strange, contact CAT Inc. Technical Support at the number listed on page 28 under the Technical Support Section.

To print a report:

1. Start the AMPS program and display the Patient Identification screen.

2. Use the Quick Find or Browse method to display the patient/client for whom you want to print a report. (See the section entitled *Finding a Patient/Client* for details.)

3. Click on the **Reports** button. The Report Selection screen displays:



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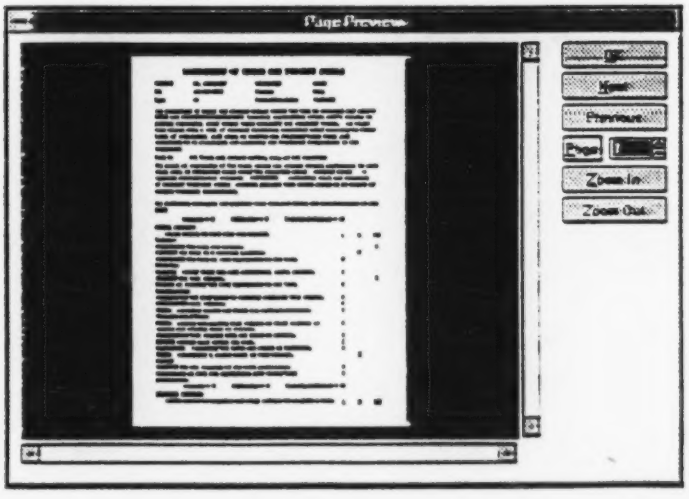
4. If more than one evaluation date displays, click on the date of the evaluation for which you want to print the report. **If you do not select an evaluation the program defaults to printing reports for the first evaluation in the list.**

5. Click on the check box next to the report to be printed. If you do not wish to print the selected report, click on the check box again and the check mark will disappear. You may also preview the report and then elect not to print it.

   - If printing your Notes, you can rename the report by entering a title to print on the report, and indicate if you want to include demographics.

   - If printing the Graphical Report, you must *double-click* on the appropriate evaluation date at the top of the screen. A small vertical bar will appear next to the date of the evaluation. Then click on the check box next to the graphical report.

6. Click on the **Preview** button to view the report on the screen before sending it to the printer. The Page Preview screen displays:



7. Click anywhere in the report to enlarge the text so you can read it.

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8. Click on **OK** when you have finished previewing the report. You will return to the Report Selection screen.

9. If the report meets your approval, reselect the report and then click on the **Print** button to send the selected report to the printer. Sample reports are included at the end of this manual. Other examples are included in the AMPS Manual.

Maintaining AMPS

Several utilities are included in AMPS to assist in choosing tasks, adding raters, and exporting data. These utilities are accessed by clicking on the maintenance button on the right of the Patient Identification screen.

1. Start the AMPS program and display the Patient Identification screen.

2. Click on the **Maintenance** button. A password screen appears. *The default password is seven zeros*. Next, a screen listing the available utilities appears. There is a button assigned to each of the utilities.

To Modify the Task List:

To modify the list of tasks that are displayed on the Evaluation screen, click on the **Modify Tasks** button. A list of all of the available tasks appears. If certain tasks are not evaluated at your institution, this utility allows you to ensure that they do not appear on the Evaluation screen. Double clicking on a task causes an asterisk to appear to the left of the task. This indicates that the task has been selected and will **NOT** appear on the list of tasks on the Evaluation screen. If you evaluate only a few tasks, you can alternately select all of the tasks by clicking on the **Select All** button at the bottom of the screen. Double click on the tasks that you do want to appear on the Evaluation screen and they will be removed from being selected.

To Add a New Rater:

To add a new rater or to update your old rater calibration to the AMPS system, click on the **Add Rater** button. Place the disk that has the new or updated rater's name, rater ID and rater severity in the disk drive. Select that drive, chose the RATER.DAT file and then highlight the open button and the appropriate data will automatically be added to the AMPS system.

To Send Data to the AMPS Headquarters

To export data to be returned to AMPS Headquarters, click on the **Export Data** button. A screen opens that allows you to select the directory where you want the appropriate data to be written. Preferably, this will be a floppy drive. ***The program will not allow you to save the export data in the same directory as the AMPS program.*** Place a formatted disk in the drive you have selected

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and then click on the **Select** button. The appropriate files will automatically be written to the indicated drive. You will need to export data for two reasons: completion of your rater calibration and for special analyses for research *or* to contribute to revisions of the computer-scoring software. Completion of rater calibration requires that you evaluate and submit data for 10 clients within 6 months of taking an AMPS training course. Upon receipt of your data, they will be analyzed and your final rater severity value will be calculated and forwarded to you.

Exported data is formatted in a manner to ensure patient/client confidentiality. Only the person's initials, demographic data (e.g., age, gender, diagnosis) and AMPS raw scores are exported. Patient/client identification numbers and full names remain confidential and are deleted from the exported data.

Exiting AMPS

To exit AMPS, select the **Exit** button on the Patient/Client Identification screen. At that time you will be asked if you wish to back-up your data. If you indicate yes, then a select directory screen will open allowing you to specify where you would like to have your back-up files saved. *It is strongly recommended that you back-up your data on a regular basis to a floppy disc or other removable media. In case of a hardware failure you may only be able to restore your data bases to be current as of your last back-up.*

Technical Support

1. Software support is provided directly by Computer Adaptive Technologies, Inc. via FAX, Internet, Bulletin Board System, and direct phone support.

2. Priority is given to technical support questions presented in writing. You may FAX your questions to (312) 274-3287 Attention: AMPS Technical Support. When technical support is required during installation, in response to an error message, or if the program behaves erratically, Windows users should please submit the following: (1) a copy of your AUTOEXEC.BAT file; (2) a copy of your CONFIG.SYS file; and (3) a screen print of the results of typing in "MEM" while in DOS and not in Windows. A copy of the required files can be obtained by loading the files into any word processor and printing them. DO NOT save the files as word processor documents after printing. Be sure to include a return FAX number as well as a phone number. FAX inquires are also answered during evening hours whenever possible. Recent technical support updates are also stored in the README.TXT file found on the AMPS installation disk.

3. For additional support, contact CAT's Technical Support staff at (312) 274-HELP from 9 a.m. to 5 p.m., Central Standard Time.

4. Technical support will also be available via the Internet after June 15, 1995. Address your inquiries to TechSupp @ CATINC.COM

5. Support policies are subject to change without notice.

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Appendix B

Sample Reports

The following sample reports are included:

1) Assessment of Motor and Process Skills Report

2) Notes Report

3) Graphical Report

4) Misfit Report

5) AMPS Raw Scores Report

ASSESSMENT OF MOTOR AND PROCESS SKILLS

Client:	MR. PUBLIC	**Therapist:**	ANNE, FISHER
Id:	123456	**Gender:**	Male
Age:	50	**Evaluation Date:**	05/05/95

The Assessment of Motor and Process Skills (AMPS) was used to determine how MR. PUBLIC'S MOTOR and ORGANIZATIONAL/ADAPTIVE (process) capabilities affect MR. PUBLIC'S ability to perform functional DAILY LIVING TASKS necessary for COMMUNITY LIVING. The tasks were chosen from a list of standard functional activities rated according to their level of complexity. MR. PUBLIC chose to perform the following tasks which MR. PUBLIC considered to be meaningful and necessary for functional independence in the community:

Task 1: A-3 Pot of tea or coffee

The level of complexity of the tasks chosen was average. Overall performance in each skill area is summarized below using the following scale: ADEQUATE SKILL: no apparent disruption was observed; DIFFICULTY: ineffective skill was observed; or MARKEDLY DEFICIENT SKILL: observed problems were severe enough to be unsafe or require therapist intervention.

The following strengths and problems were observed during the administration of the AMPS:

Adequate = A **Difficulty = D** **Markedly Deficient = MD**

MOTOR SKILLS:

Skills needed to move self and objects.	A	D	MD
Posture:			
STABILIZING the body for balance.	X		
ALIGNING the body in a vertical position.	X		
POSITIONING the body or arms appropriate to the task.			X
Mobility:			
WALKING: moving about the task environment (level surface).	X		
REACHING for task objects.	X		
BENDING or rotating the body appropriate to the task.	X		
Coordination:			
COORDINATING two body parts to securely stabilize task objects.	X		
MANIPULATING task objects.	X		
FLOWS: executing smooth and fluid arm and hand movements.	X		
Strength and Effort:			
MOVES: pushing and pulling task objects on level surfaces or opening and closing doors or drawers.	X		
TRANSPORTING task objects from one place to another.	X		
LIFTING objects used during the task.	X		
CALIBRATES: regulating the force and extent of movements.	X		
GRIPS: maintaining a secure grasp on task objects.	X		
Energy:			
ENDURING for the duration of the task performance.	X		
Maintaining an even and appropriate PACE during task performance.	X		

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ASSESSMENT OF MOTOR AND PROCESS SKILLS

Therapist: ANNE, FISHER

Adequate = A **Difficulty = D** **Markedly Deficient = MD**

PROCESS SKILLS:

Skills needed to organize and adapt actions to complete a task.	A	D	MD
Energy:			
Maintaining an even and appropriate PACE during task performance.	x		
Maintaining focused ATTENTION throughout the task performance.	x		
Using Knowledge:			
CHOOSING appropriate tools and materials needed for task performance.	x		
USING task objects according to their intended purposes.	x		
Knowing when and how to stabilize and support or HANDLE task objects.	x		
HEEDING the goal of the specified task.	x		
INQUIRES: asking for needed information.	x		
Temporal Organization:			
INITIATING actions or steps of task without hesitation.			x
CONTINUING actions through to completion.	x		
Logically SEQUENCING the steps of the task.	x		
TERMINATING actions or steps at the appropriate time.	x		
Space and Objects:			
SEARCHING for AND LOCATING tools and materials.	x		
GATHERING tools and materials into the task workspace.	x		
ORGANIZING tools and materials in an orderly, logical, and spatially appropriate fashion.	x		
RESTORES: putting away tools and materials or straightening the workspace.	x		
NAVIGATES: maneuvering the hand and body around obstacles.	x		
Adaptation:			
NOTICING AND RESPONDING appropriately to nonverbal task-related environmental cues.	x		
ACCOMMODATES: modifying ones actions to overcome problems.	x		
ADJUSTS: changing the workspace to overcome problems.	x		
BENEFITS: preventing problems from reoccuring or persisting.	x		

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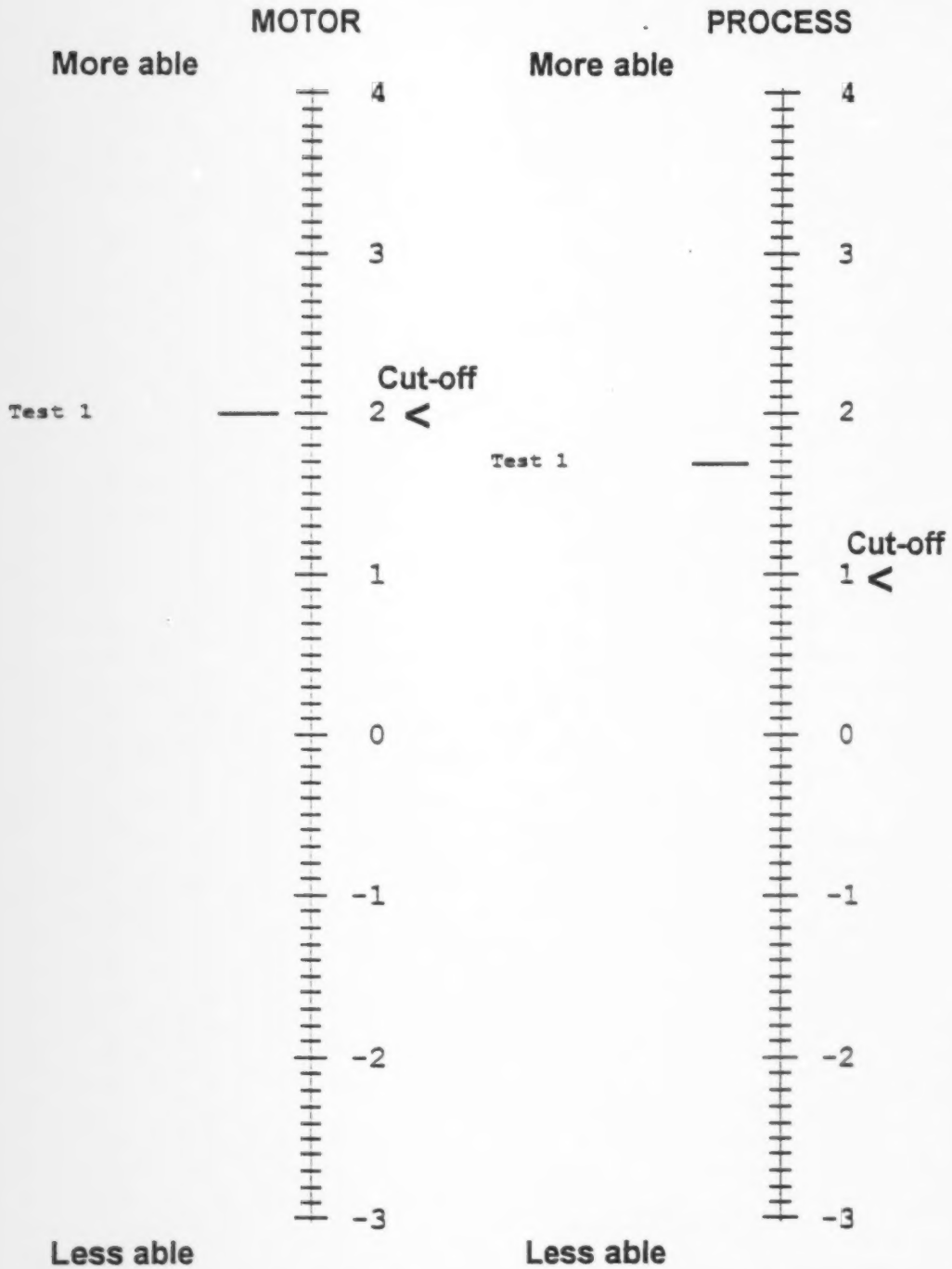
NOTES

Client:	MR. PUBLIC	**Therapist:**	ANNE, FISHER
Id:	123456	**Gender:**	Male
Age:	50	**Evaluation Date:**	05/05/9.

Mr Public is progressing well

GRAPHIC REPORT OF MR. PUBLIC'S AMPS RESULTS



MR. PUBLIC'S AMPS motor and process ability measures plotted in reference to AMPS scale cut-off measures indicative of evidence of problems that impact on performance.

	MOTOR	PROCESS
Test 1	2.0	1.7

MISFIT REPORT

Client:	MR. PUBLIC	**Therapist:**	ANNE, FISHER
Id:	123456	**Gender:**	Male
Age:	50	**Evaluation Date:**	05/05/95

The following misfitting ratings were noted

The item score for Initiates was unexpectedly low on the task A-3 Pot of tea or coffee

Refer to the AMPS manual for further information regarding possible reasons

AMPS RAW SCORES

Client:	MR. PUBLIC	Therapist:	ANNE, FISHER
Id:	123456	Gender:	Male
Age:	50	Evaluation Date:	05/05/95

Task 1: A-3 Pot of tea or coffee

MOTOR SKILLS

Posture:	Task 1
Stabilizes:	4
Aligns:	3
Positions:	1

Mobility:	Task 1
Walks:	4
Reaches:	3
Bends:	4

Coordination:	Task 1
Coordinates:	3
Manipulates:	4
Flows:	4

Strength and Effort:	Task 1
Moves:	4
Transports:	4
Lifts:	3
Calibrates:	3
Grips:	4

Energy:	Task 1
Endures:	4
Paces:	4

Therapist: ANNE, FISHER

PROCESS SKILLS

Energy:	Task 1
Paces:	4
Attends:	4

Using Knowledge:	Task 1
Chooses:	4
Uses:	3
Handles:	4
Heeds:	4
Inquires:	3

Temporal Organization:	Task 1
Initiates:	1
Continues:	4
Sequences:	4
Terminates:	3

Space and Objects:	Task 1
Searches/Locates:	4
Gathers:	4
Organizes:	3
Restores:	4
Navigates:	3

Adaptation:	Task 1
Notices/Responds:	4
Accommodates:	4
Adjusts:	4
Benefits:	4